# Snakes of Kansas

by Edwin B. Branson

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## Introduction.

The original intention of the author was to include in this paper only snakes that he knew occured in Kansas, but he has found it desirable to add descriptions of others that have been reported from the State, but the occurrence of which appears doubtful. He has also included descriptions of species that may reasonably be expected to occur in the State because they are found close to its boundaries.

The first list of Kansas snakes was published by Annie E. Mozley in 1878. This list included only those species preserved in the museum of Kansas University. It gave thirty-two species and two subspecies, but the writer has had access to the material used by Miss Mozley and finds only twenty-three valid species and four valid subspecies. Eutaenia sirtalis, E. saurita, E. parietalis, E. marciana, E. proxima and one unidentified species of garter snake are listed by Miss Mozley but the writer has failed to find Eutaeina marciana and Eutaenia saurita in the collections. Mozley's E. sirtalis, E. sirtalis dorsalis and E. parietalis belong to the species sirtalis. The corrected list of garter snakes contains four species E. sirtalis, E. radix, E. proxima and E. elegans. Mozley's Heterodon cognatus and Heterodon atmodes are now included under Heterodon platyrhinus. Mozley's Ophibolus eximinis, Ophibolus gentilis and two unidentified species belong to one species Ophibolus doliatus. Bascanion flaviventris, Bascanion foxi and B. constrictor are synonymous and are now called Zamenis constrictor. Heterodon simus listed by Mozley proved to be H. nasicus.

In 1880 B.F. Cragin published a list of Kansas snakes. The list includes thirty-two species, but the writer after having examined all of the important collections of snakes in the State has failed to find the following species and sub-species given in the list, Heterodon simus, Eutaenia marciana, Eutaenia saurita, Coluber confinis, Coluber vulpinus, ~~Diadophis arnyi~~, Tropidonotus sipedon erythrogaster Diadophis amabilis and Diadophis arnyi. Heterodon simus, Eutaenia marciana and Eutaenia saurita are listed principally on the authority of Mozley. As Cragin's list is a compilation not verified by himself

I shall need further evidence before including the eight species given above as Kansas snakes.

In this paper all species that have been reported from Kansas are described, but those that the writer has not ~~met with~~ encountered during his investigations are marked doubtful. The writer has examined the collections at the State University, State House, Washburn College, Ottawa University, State Normal School, State Agricultural College and several high schools in the State, is perfectly familiar with the local fauna of Brown and Republic Counties, has collected in the central eastern, southern and western parts of the State and believes that if he has not met with any specimens of a species there are good grounds for believeing that that species is not found in Kansas. Twenty-nine species and thirteen sub-species are listed in this paper. The localities where specimens have been captured are given with descriptions.

The nomenclature used by Cope in his "Crocodilians, Lizards and Snakes" (1900) has been used in this work excepting where change seemed absolutely necessary. In such cases the nomenclature employed by Brown (2, 1901) is used. The synonymic lists are taken from the works above mentioned. The common names used are those given by Yarrow in his "Check List Reptilia and Batrachia"

The descriptions given in this paper are for the most part based upon living specimens. Where this is not the case it is noted in the description. Alcohol and formalin do not preserve colors, so that descriptions of preserved specimens are not entirely satisfactory Ridgeway's "Nomenclature of Colors" has been used as a guide in determining colors. The drawings are nearly all original, having made by the author. All borrowed drawings are taken from Cope's "Crocodilians, Lizards and Snakes".

Only four species of venomous snakes are known to occur in Kansas, but I think it quite probable that one other species, the water moccasin, occurs in the south-eastern part of the State. The poisonous snakes are the timber rattlesnake (Crotalus horridus), the prairie rattlesnake (Sistrurus catchatus), the massauga, (Crotalus confluentis) and the copperhead, (Ancistrodon contortrix). Rattlesnakes are easily distinguished from harmless snakes by their rattle. All of the poisonous snakes found in Kansas have a deep pit between the eye and the nostril, erectile poison fangs in the anterior part of the up-

upper jaw, and the pupil of the eye shaped like a double convex lense

Little is known concerning the habits of snakes. Perhaps more negative than affirmative facts are at hand for almost all popular beliefs concerning snakes are untrue. The number of rattles is no indication of the age of rattlesnakes. It is probably untrue that snakes swallow their young. Snakes do not moult every time they eat. The breath of snakes is not poisonous. Many of the so called poisonous snakes are harmless. (See list of poisonous snakes above) Habits as far as known are given with the descriptions of the species.

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## Glossary.

Anal plate.- The large scale in front of the anus in snakes .

Anteorbital.- A small plate which lies immediately in front of the Eye.

Azygous.- Single. Not one of a pair.

Carinated.- With a keel or sharp ridge.

Frontal.- The large plate on the top of the head between the superciliaries.

Gastrosteges.- Large plates along the belly.

Genials.- Large scales behind the mental.

Infralabials.- Plates on the lower lip.

Internasals.- Scales just behind the rostral.

Keel.- A ridge along a scale.

Labials.- Plates on the lips.

Loral.- See loreal.

Loreal.- The plate occupying the space between the nasals and the preoculars.

Maculate.-Spotted.

Mental.— Plate at tip of mandible.

Occipitals.- Plates behind the frontal and superciliaries.

Parietals.- See occipitals.

Postgenials.- Posterior pair of genials.

Postoculars.- Plates bounding the orbit behind.

Prefrontal.- Plates just in front of the frontals.

Pregenials.- Anterior pair of genials.

Preocular.- Plates bounding the orbit in front.

Rostral.- Plate at the tip of the snout

Scute.- A scale.

Superciliary.- The plates above the eyes.

Supralabials.- Plates on the upper lip.

Supraocular.- Same as superciliaries.

Urosteges.- Large plates on the lower surface of the tail.

Mentals

Order Ophidia.

Body elongated, slender; covered with scales. Limbs wanting (Vestigeal hind limbs present in some species). Mandibles loosely articulated; quadrate long, and freely movable. Shoulder girdle absent. No eyelids or external organs of hearing.

Key to Families.

No pit between eye and nostril. No erectile fangs. Pupil of eye round ---------- Colubridae.

Pit between eye and nostril. Erectile fangs. Pupil of eye elongated, vertical------ Crotatidae.

Colubridae.

I. Dorsal scales carinated.

a. Anal entire.

Scales in 27-33 rows------ Pityophis.

Scales in 17-23 rows------- Eutaenia.

Scales in 19-[illegible] rows. One nasal. Tropidoclonium.

b. Anal divided.

1. Loreal present.

Scales in 17 rows. One nasal--- Cyclophis

Scales in 23-25 rows. Rostral large, recurved----- Heterodon.

Scales in 19-29 rows. Gastrosteges less than 170---- ~~Coluber~~ Natrix.

Scales in 27-35 rows. Gastrosteges more than 170------- Coluber.

2. Loreal absent. Scales in 15-17 rows--Storeria

II. Dorsal scales smooth.

a. Anal entire------ Ophibolus

b. Anal divided

Scales in 13 rows. One nasal-- Carphophiops

Scales in 15 rows. A pale ring on the neck Diadophis.

Scales in 15 rows. Color green. Liopeltis

Scales in 15-19 rows-- Zamenis

Scales in 15 rows. No loreal Tantilla

Scales in 15-17 rows. One nasal. Contia.

Crotalidae.

I. Rattle present.

1. Top of head with plates----- *Sistrurus*.

2. Top of head with scales----- *Crotalus*.

II. No rattle present-------- *Ancistrodon*.

Pityophis, Holbrook.

Pityophis, Holbrook, N. Amer. Herpetology, IV, 1842, p. 7.- Baird and Girard, Cat. N. Amer. Rept. Pt. I, Serp. 1853 p. 64. Churchillia, Baird and Girard, Reptiles in Stransburys Expl. Great Salt Lake, 1852, p. 350.

Maxillary teeth equal. Rostral high, recurved. Loreal present One preoccular,(occ. two). Three to six prefrontals. Two nasals, Head broad behind. Size large. Body spotted.

Key to species.

Rostral prominent; head bands distinct; head long; spots small and numerous. P. catenifer. Rostral more prominent; no head-bands; head short; spots few and large. P. melanoleucus. Pityophis catenifer, Blainville, Bull-snake, Western Pine Snake Coluber catenifer, Blainville, Nouv. Ann. Mus. Hist. Nat., LV, 1835, p. 290.

Key to Sub-species of Catenifer.

| | |
|---|---|
| Rostral very high, recurved-------- | P. c. sayi. |
| Rostral lower, less curved------- | P.c. bellona |
| Rostral low and broad----- | P.c. catenifer. |

Pityophis catenifer sayi, Schlegel, Bull snake.

Coluber sayi, Schlegel, Ess. Phs. Serp., II, 157, 1837.

Pityophis sayi sayi, Cope, Check-list, N. Amer. Batr. Rept., 1875. p. 39.

Pityophis sayi, Baird and Girard, Cat. N. Amer. Rept., Pt.I, Serpents 1853, p. 151.

Pityophis Mexicanus, Dumeril and Bibron, Erp. Gen., VII, 1854 p. 236. Dorsal scales in 27-33 rows; all keeled excepting first, five to ten rows. Occipitals broken up into many small plates posteriorly. Supercillaries broad behind, narrow in front. Prefrontals 3-7. Internasals rounded in front. Rostral very high, strongly curved. Two nasals, anterior larger, nare mostly in posterior. Loreal trapezoidal. Oculars 1-3 (occ. 2-3) Superior labials 8-10, seventh and eighth largest, fifth entering orbit. Inferior labials 10-13, seventh largest. Pregenials large. Postgenials very small. Gastrosteges ~~in two series~~ 220-240. Urosteges in two series, 45-60, Anal entire.

Color above yellowish to reddish brown. Three series of dorsal spots, reddish-brown to black. Forty to seventy on body; Median spots largest, elongated anteriorly. Anterior spots in second series frequently coalescing, forming a dark stripe. Two or three more or

less well defined, lateral series of lighter spots. These frequently form black stripes, anteriorly. Narrow white stripes between the anterior dark stripes. A series of black spots on the margin of the gastrosteges, involving a part of the first row of scales. Belly whitish; large black blotches down the middle. Throat and chin white with small black spots. First eight or nine inferior labials margined with black. Top of head whitish or yellowish with brown or black spots or crossbars. Only one complete crossbar present. It crosses the anterior part of the frontal. A dark stripe from orbit to angle of mouth generally present.

Body large and strong. Neck slightly constricted. Head pointed/ Tail short and slender. Eye large.

The following are the scuta dimensions and number of spots of seven specimens from Douglas County.

| Length | Tail | Gas. | Urosteges. | Upper L. & 1. Lower L. | Scales | Tail S. | Body S |
|---|---|---|---|---|---|---|---|
| 63 1/2 | 6 1/8 | 235 | 53 | 9-9 12-12 | 32 | 10 | 50 |
| 48 | 5 1/4 | 232 | 48 | 8-9 12-11 | 29 | 12 | 57 |
| 67 1/2 | 8 | 226 | 59 | 9-9 13-13 | 29 | 9 | 49 |
| 55 | 5,1/2 | 232 | 49 | 9-8 13-10 | 29 | 12 | 40 |
| 62 | 7 12 | 226 | 58 | 9-9 14-13 | 31 | 12 | 53 |
| 50 | 5 1/4 | 232 | 48 | 8-9 13-12 | 30 | 11 | 56 |
| 47 | 6 | 234 | 55 | 9-10 --- | 31 | 10 | 54 |

The Bull snake is the largest and one of the most abundant of Kansas Snakes. Individuals nine feet long are sometimes found. The adults are very gentle offering little or no resistence when handled but the younger individuals will fight viciously. The fifteenth of last August twelve snake eggs were brought to me by a farmer living near Lawrence. I opened one of them immediately and found that it contained a bull snake eight inches long. The snake was surrounded by a gelatinous mass. Its color was olive- buff with the spots faintly outlined in darker. The cephalic plates were well developed. It was able to raise its head about one third of an inch, but it could not open its mouth. It could see large moving objects. The hemipenis was protruded and small calcifications were already present on it.

I placed the other eggs in damp sand where the direct rays of the sun could not reach them. The weather was cool and damp most of the time of their hatching. September 28th two snakes hatched and during the next three days eight more came out of the eggs. They were fifteen to fifteen and one-half inches long. They were fat and it seemed in-

credible that they could have come out of such small eggs. The eggs were 2 2/5 inches in length by 4 2/5 inches in circumference. The young snakes were like adults in scutellation and coloration. They were very irritable, hissing and striking at whatever came near them. Before they were entirely out of the egg they hissed and struck. They could not strike accurately until they were several weeks old. Their teeth were very small and weak. I allowed them to strike my hand, but they could do no injury. They did not open the mouth wide enough in striking, and the point of the nose struck the offending object. I often thrust my finger into their mouths but they did not try to close their jaws. At two months old they had become quite gentle but they would strike and hiss occasionally when startled. They were still not able to inflict any injury. Their length had increased to eighteen inches. October 19 they began to moult. Conditions were not favorable and the process took several days. The skin being moulted was so thin and delicate that it broke and was sloughed off in patches.

I buried five young Bull Snakes and one adult December 5. I placed them in a box partially filled with earth and rubbish and buried them about two and one half feet deep. I took them up again March 10. They were all in good condition, but were not very active until April 10. For three or four days after this the young snakes were very active and would crawl rapidly towards the cage door and try to escape whenever it was opened. They were more pugnacious than they had been when placed in their winter quarters. April 15 I fed them, using a pipette with a large rubber bulb at the end, filling the pipette and bulb with a half mixture of egg and water, thrusting the tube down their throats about six inches, and forcing the contents into their stomachs. This was the first food they had taken since their birth. They were at this time nineteen inches in length. The taking of food brought back some of their pugnacity for they hissed and struck whenever disturbed. They were still unable to inflict a wound on one's hand.

The Bull Snake feeds upon rats, mice, gophers, birds and other small animals. One, three feet in length, that I had in the laboratory last summer swallowed three fully- grown sparrows for one meal and the next day it swallowed a pigeon egg. It is now six months since this snakes' big meal and it has eaten nothing ~~more~~ since. This snake moulted twice from July 1st to January 1st.

The Bull Snake occours throughout the state. It has been reported from Franklin, Republic, Cloud, Brown, Mitchell, Shawnee, Lyon, Doniphan, Clay, Harvey, Sumner, Ford, Pottawatomie, Sherman, Phillips, Osborne, Geenwood, Neosho, and Jefferson, Counties.

## Tropidoclonium.

Tropidoclonium, Cope, Proc. Acad. Nat. Sci. Phila., 1860, p. 76.

Dorsal scales in nineteen rows; all keeled excepting first and second rows. Cephalic scuta normal. Two internasals: One loreal. Urosteges in two series. One nasal. Rostral low. Teeth equal. Head not distinct from body.

Tropidoclonium lineatum, Cope, Lined Snake.

Tropidoclonium lineatum, Cope Proc. Acad. Nat. Sci. Phila., 1860, p. 76.
Microps lineatus, Hallowell, Proc. Acad. Nat. Sci. Phila., 1856, p.24.
Ischnognathus lineatus, Boulenger, Cat. Snakes. Brit. Mus. I. 1892,p.289.

Dorsal scales in nineteen rows all keeled excepting the first and second rows; first row as broad as long. Frontal small and regular in shape; longer sides parallel; anterior border with a very large angle. Parietals narrow and short. Prefrontals almost square. Internasals right-triangular. Rostral wide and very low. One nasal; nare in anterior part. Loreal longer than high. One preocular. Two postoculars. Temporals 2-2. The lower temporal in the first row extends down between the fifth and sixth labials. Supralabials six, fifth and sixth largest. Infralabials six, fourth and fifth largest. Gastrosteges 153 and urosteges 33 in the type specimen. Pregenials longer than postgenials. Anal entire. Urosteges in two series.

| Length | Tail. | Gastrosteges | Urosteges | Scales |
|---|---|---|---|---|
| 6 1/4 | 7/8 | 143 | 33 | 19 |
| 10 | 1 5/8 | 141 | 43 | 19 |
| 5 1/4 | --- | 141 | --- | 19 |
| 13 | 1 3/4 | 140 | 33 | 19 |
| 12 1/2 | 1 1/2 | 153 | 153 | 19 |

The above are the dimensions and scutella of five specimens from Douglas County in the University Museum.

Color above light-brown to dark brown. In the type specimen no spots are visible on the dorsal surface. In the lighter colored specimens there is a row of black dots on each side of the dorsal stripe and another row near the lateral stripe. A dorsal stripe covering one and two half-rows of scales extends from the occiput to the tip of the tail. A lateral stripe on the second and lower half of the third row of scales. The dorsal stripe is yellowish. The lateral stripe yellowish mottled with brown. Inferior row of scales brownish. Margin between scales and gastrosteges whitish. Belly greenish with two rows of triangular

black spots down the middle. The color is darker green between the spots Upper part of head mottled with black and brown. Superior labials drab. The lower part of the temporals of the same color. Under part of the headwhitish; often maculated with small black spots.

This snake is found throughout the state. On account of its retiring habits and its smallness it is little known. It lives under rotting timber, etc. It does not become exterminated as civilization advances, but lives in large numbers under sidewalks and trashpiles in cities. Several specimens from Douglas County are in the University Museum. I have examined specimens from Mitchell, Shawnee, Republic, Lyon and Leavenworth Counties.

## Heterodon. Latreille.

Heterodon Latreille, Hist. Nat. des Reptiles, IV, 1799, p. 32. Baird and Girard, Cat. N. Amer. Rept., 1853, p. 51. Boulenger, Cat. Snakes Brit. Mus. II, 1894, p. 153.

Posterior maxillary teeth much enlarged. Rostral plate very high with upturned edges and anterior face flat. A small plate (azygos) behind the rostral. In two species, there are several other small plates near the azygous. Anal plate divided. Caudal scutella in two series. Scales keeled, in 23-25 rows.

The Spreading Vipers are commonly supposed to be very poisonous. It is hard to understand how they received this reputation as they are very gentle. It may be because of their ugliness or because they are often mistaken for Copperheads and Copperheads mistaken for them. Scientists considered them poisonous because the posterior maxillary teeth are much enlarged. It is now known that they are harmless.

### Key to species.

I. No scales between prefrontals---- H. platyrhinus.

II. Prefrontals separated by scales.

1. Scales in 25 rows. Prefrontals separated by scales H. simus
2. Scales in 23 rows. Prefrontals and internasals separated by scales.-------- H. nasicus.

Heterodon platyrhinus, Latreille, Spreading Viper. Heterodon platyrhinus, Latreille, Hist., Nat. des Reptiles, IV, 1800, p.32.- Baird and Girard, Cat. N. Amer. Rept. Pt. I, Serpents, 1853, p. 51. Heterodon niger, H. cognatus, H. atmodes, Baird and Girard. Cat. N.Amer. Rept. 1853, pp, 55, 54 and 57.

Coluber heterodon, Daudin, Hist. Nat Rept. VII 1799, p. 153.

Twenty-five rows of scales; inferior row not keeled; scales rounded at the tips. Frontal wide anteriorly, narrowing rapidly towards the posterior end. Superciliaries very wide, longer than the frontal. Occipitals pentagonal, short and narrow. Prefrontals of medium size, irregularly pentagonal. Internasals triangular, with the apex pointing inward. Rostral prominent but not as large as in H. nasicus. Azygous plate extending half way between prefrontals. Rostral extending half way between internasals. Loreal short, much higher than long. Oculars nine to eleven. Upper labials eight. Lower labials generally eleven. Temporals 3-4 or 4-4. Gastrosteges 125-150. Urosteges 40-60.

The following are the scutella and dimensions of four specimens from Douglas County in the Kans. Univ. Mus.

| Length | Tail | Gastrosteges | Urosteges | Scales |
|---|---|---|---|---|
| 26 | 5 3/4 | 134 | 49 | 25 |
| 31 | 6 1/2 | 135 | 53 | 25 |
| 30 7/8 | 4 3/4 | 147 | 43 | 25 |
| 31 1/2 | 4 1/2 | 140 | 43 | 25. |

Color above brown to black. Black specimens are rare. A dorsal series of dark quadrate blotches separated by interspaces of one to two scales. Margins between blotches and interspaces frequently white? Small dark oval to round blotches alternate with the dorsal. Two black blotches on the nape. Belly greenish to yellowish white, occasionally black. Top of head lighter than dorsal blotches. A black line across prefrontals and preoculars joins the anterior angles of the orbits. A black line crosses the superciliaries and the base of the frontal, joining the posterior angles of the orbits. The snout is much lighter brown than the top of the head. Upper labials yellowish, widely margined with bluish-brown and dotted with dark-brown. Last labial brown. Chin and throat yellowish

Body short and stout. Tail short. This is the largest of the Heterodons. I have examined specimens three feet long. When disturbed this snake inflates its lungs, flattens its head, and opens its mouth.

It rarely if ever strikes except when it is being handled.

Found throughout the State. Specimens have been reported from Mitchell, Republic, Rooks, Barber, Lyon, Shawnee, Douglas, Franklin, Geary, Phillips, Ellsworth, Logan, Montgomery, Harvey, Osborne, Pottawatomie and Sumner, Counties

Heterdon nasicus, Baird and Girard, ~~Spres~~

Spreading Viper, Texas Rooter, Hognosed Snake.

Heterdon nasicus, B. and. G. Cat. N. Amer. Rept. Pt. 1. Serpents 1853 p. 61

Heterdon simus nasicus and H. nasicus nasicus, Cope, List N. Amer. Batr. Rept., 1875, p. 43.

Dorsal scales in twenty-three rows; outer row smooth, second row faintly keeled, all of the others strongly keeled. Frontal and parietal wider than long. Rostral broad and high, ouline rounded, azygous plate surrounded by from eight to twenty-five small scales. Two loreals on each side. Supralabials very high. Pregenials much larger than postgenials. Temporals 1-2. Orbital plates ten to twelve. Superior labials eight ( occ. Nine). Inferior labials ten to thirteen. Gastrosteges in type specimen 150. Urosteges 32. Anal plate divided. The following are scutella formula and measurements of four specimens in the Kansas University Mussum.

| Length | Tail | Gastrosteges | | Urosteges | Scales |
|---|---|---|---|---|---|
| 27 | 2 5/8 | 152 | | 31 | 23 |
| 16 | 1 5/8- | 151 | | 31 | 23 |
| 7 1/4 | 1 | 150 | 30 | 30 | 23. |
| 7 1/2 | 1 1/4 | 151 | | 30 | 23 |

Color above brown; forty-five to fifty-five dorsal spots from occiput to end of tail. These spots are two scales long by ten scales wide. Alternating with them is another series of spots on each side. These are two scales long by four wide. There are four rows of spots on each side of the dorsal row. The spots in the last row are very small. They give to the sides a finely mottled appearance. The spots are dark-brown The color of the abdomen is white, maculated by a series of black spots. These cover two-thirds of the length of each gastrostege and extend over three gastrosteges anterio-posteriorly. The spots corner with each other making the series zig-zag. Occasionally the abdomen is entirely black. Urosteges black. Throat white. A white band extends from the eye across the last three upper labials to the angle of the mouth. A white band extends across the supercillaries and frontal connecting the eyes. Inferior labials white. Spperior labials darker above.

This snake is very gentle and it is almost impossible to induce it to bite. It is needless to say that it is not ppisonous. It probably feeds upon grubs captured by burrowing. I kept one in this laboratory for

six months, and during that time it would not take food of any kind, and it finally died of starvation. H. A. Bronus (14, II, 136) tells of a strange habit of this snake. He once found a small turtle (Cistudo ornata) with a Hognosed Snake attached to its hind foot. It took no little effort to force the snake to release its hold. As there was little blood in the limb and none had escaped from the snake's mouth it had probably been sucking the turtle's blood. The snake had evidently been holding to the foot for some time. Mr. Bronus examined many turtles after this discovery and found that the hind feet were in many cases mutilated. The front feet were not injured because the turtles were able to defend them. Inquiry revealed that other persons had observed the same habit. The snake probably attaches itself in order to suck the blood of its victim.

The Hognosed Snake occurs throughout the state. I have examinied specimens from Clay, Hamilton, Rawlins, Republic, Mitchell, Ellsworth, Douglas, Lyon, Franklin, and Norton Counties. Specimens have been reported from Montgomery, Stanton, Logan, Morton, Neosho, Osborne and Phillips, Counties

Storeria, Baird and Girard, Cat. N. Amer. Rept., Pt. I, Serpents, 1853, p. 135.

Ischnognathus, Dumeril, Prodrome des Ophidiaens, 1853, p. 72.

Dorsal scales carinated, fifteen to seventeen rows. Cephalic plates normal. Anal divided. Subcaudals in two series. Head distinct from body.

Key to Species

Dorsal scales in 15 rows; oculars 2-2; five or six upper labials. S. occipitomaculata. \ Dorsal scales in 17 rows: oculars 1-2; seven upper labials. S. dekayi.

Storeria occipitomaculata, Baird and Girard, Storer's Snake.

Storeria occipitomaculata, Baird and Girard, Cat. N. Amer. Rept. Pt. 1 Serp., 1853. p. 137.

Tropidonotus occipitomaculatas, Storer, Rep. Rept. Mass., 1839, p. 230.

Ischnognathus occipitomaculatus, Gunther, Cat. Colubine, Snakes. Brit. Mus. 1858. 1858, P. 61.

Dorsal scales all keeled in fifteen rows. Frontal broad, hexagonal. Superciliaries narrow, about the same width posteriorly as anteriorly. Occipitals large. Prefrontals quadrangular broad and short. Internasals with the posterior and inner margins straight, the outer margin curved. Rostral broad, of medium height. Nasals large, nostril in anterior. Posterior nasal in contact with preocular. Oculars 2-2. Temporals 1-1. The first temporal extends for half the length of the sixth labial. Upper labials six, first, fifth and sixth longer than high. Eye above third and fourth labials. Lower labials seven, fourth and fifth lagest. Pregenials longer than post genials. First gastrostege not divided. Gastrosteges 120-140. Urosteges 40-60.

Length about 20 inches, tail about three inches. Body slender. Color above olive or chestnut brown, uniform or with a lighter dorsal stripe three scales in width. A stripe of the same color on the outer row of scales? On each side of the dorsal stripe two rows of minute brown spots are sometimes present. These spots are on the bases of the scales of the third row from the dorsal. Belly in alcoholic specimen whitish yellow to greenish. The ends of the gastrosges are often very finely spotted with brown. Just behind the occipitals is a salmon colored blotch. Immediately behind the angle of the mouth is another blotch of the same color. The top of the head is brownish or grayish. The under part of the head is greenish or yellowish.

This snake is rare in Kansas. I have examinied specimens from Bourbon

and Douglas Counties. Smith (11, 698 ) states that they are somewhat nocturnal and live chiefly under rocks and stones. They live upon grass-hoppers, crickets, etc. Hay ( 10, 498) states that he found a slug in the stomach of one specimen.

Storeria dekayi, Holbrook, Dekay's Snake.

Storeria dekayi, Baird and Girard. Cat. N. Amer. Rept. Pt. 1. Serpents 1853, p. 135.

Tropidonotus dekayi, Holbrook, N. Amer. Herp., III 1842. p. 53.

Ischnognathus dekayi, Dumeril and Bibron, Erp. Gen., VII/ 1854 p. 507.

Dorsal rows of scales seventeen, all keeled; frontal hexagonal, longer and narrower than in occipitomaculata. Superciliaries narrow, slightly broader posteriorly. Prefrontals with anterior and inner margins straight outer margin curved, ~~with posterior and inner margins straight, outer margin curved?~~ Rostral narrower than in the preceding species. Two large nasals; nostril in anterior; posterior in contact with preocular. Oculars 1-2. Temporals 1-1; first temporal large, pointed posteriorly. Upper labials seven, first, second and third higher than long; eye ~~abo~~ above the fourth. Lower labials seven, fourth and fifth largest. Postgenials as long as pregenials. First gastrostege undivided, gastrosteges 120-140. Urosteges 40-60. Anal divided.

A thicker snake than occipitomaculata. Its diameter is much the greatest in the middle. Length about fifteen inches. Eyes and head small Color above grayish, to chestnut brown. A light stripe extends from the head to the end of the tail. This stripe is bordered on each edge by a series of brown spots. These spots are formed from brown on the inner side of the bases of two scales and the brown tip of the scale joining the two. Alternating with these is another series of spots formed in the same way. These spots occur at intervals of two scales. Alternating with the second series of spots is a third series. These are very small covering only the upper side of the base of every third scale of the inferior row. There is a black dot near the end of each gastrostege of some specimens. Generally these spots are somewhat obscure . The first spot of the superior row is very much enlarged and joins the first spot of the second row. In a specimen now before me the first eight spots of the first and second rows coalesce.
Head brown above. One or more small black bars across the temporals. Posterior margins of the third and fourth superior labials black. Frequently the posterior margins of some of the other labials are black. Under part of head whitish. Infralabials sometimes margined with black. Several specimens from Douglas County are in the Kansas University Museum. I have examined specimens from Wabaunsee and Wyandotte Counties. It occurs throughout the eastern part of the State.

Cope (1, 1002) states that it is entirely terrestrial in its habits. Smith (11,697) states that it is aquatic. All the specimens in the Kans. University Mus. were taken either in water or in the vicinity of water. Hay(10, 497) states that it is ovoviparous, but the evidence that he gives is not conclusive.

## Carphophiops Gervais.

Carphophiops, Gervais, Dict. Hist. Nat. Univers., per D'Orbigny, III, 1843, p. 191.

Carphophiops, Dumeril, Prodrone Class, Ophid, Pt., I. Serp., 1853, p.43&46.

Celuta, Baird and Gerard, Cat. N. Amer., Rept., Pt.1, Serp., 1853, p. 129.

Scales smooth in thirteen rows. No anteorbital. One nasal. Head very small, depressed, not distinct from body. Eye small. Anal divided.

Carphophiops amoenus, Say, Worm Snake, Western Ground Snake.

Carphophiops amoena, Dumeril and Bibron, Erp. Gen., VII, 1854, p. 132.

Coluber amoenus, Say, Jour. Acad. Nat. Sci., Phila., VI IV, 1825, p.237.

Celuta amoena, Baird and Gerard, Cat. N. Amer., Rept., 1853, p. 129.

Carphophiops amoenus and C. vermis Cope, Check-list N. Amer., Batr. Rept. 1875, p. 34.

Scales smooth in thirteen rows; first row broader than long. Occipitals short, broad. Frontal about as wide as long, hexagonal; occasionally the anterior angle is very large and the lateral margins are curved meeting in a point behind. Superciliaries very short, broader posteriorly than anteriorly. Prefrontals short and wide. Internasals very small, concavo-convex with the convex margin in front. Occasionally the internasals are not present. Rostral very narrow, recurved above and excavated below. One long narrow nasal, nare in the center. Loreal rectangular, narrow, entering the orbit. No anteorbital; one postorbital. Five superior labials, fifth largest; eye above third and fourth Inferior labials six, fourth largest. Pregenials larger than postgenials. Temporals 1-1 or 1-2. Gastrosteges very short, 125-150. Urosteges 23-36, in two series. Anal divided.

The following are the scutella and dimensions of four specimens from Douglas County in the University Museum.

| Length | Tail | Gastrosteges | Uros. | Scales | Superlabials. | Infralab. |
|---|---|---|---|---|---|---|
| 10 | 1 3/4 | 129 | 33 | 13 | 5 | 6 |
| 7 | 1 | 136 | 29 | 13 | 5 | 6 |
| 13 | 1 1/2 | 145 | 26 | 13 | 5 | 6 |
| 5 | 3/4 | 146 | 32 | 13 | 5 | 6 |

Color above uniform, chestnut brown to black. Abdomen flesh-colored; this color reaches the upper part of the second row or the lower part of the third row of sacles. Top of head lighter than the body.

Upper labials flesh colored to light brown.

I have examined specimens from Neosho and Douglas Counties. One specimen from Ft. Scott is in the National Museum. Rare in Kansas, but probably occurs throughout the eastern half of the State.

Little is known of its habits. It lives in damp places, under rocks, bark, decaying leaves, ets. Hay states that it is probably nocturnal. Holbrook states that it lives on insects.

## Zamenis, Wagler.

Zamenis, Wagler, Syst. Amph., 1830, p. 188.

Bascanion, Baird and Girard, Cat. N. Amer. Rept., Pt.1. 1853, p. 93.

Coluber, Schlegel, part, Phys. Serp., II, 1837, p. 125.

Masticophis, Baird and Girard, Cat. N. Amer. Rept. Pt.1., 1953,p. 98.

Scales smooth, in fifteen to nineteen rows. Teeth increasing gradually behind. Anal plate divided; subcaudals in two series; preoculars two, lower very small. Head distinct. Body long and slender. Young spotted or with crossbands.

### Key to Kansas Species.

1. Seventeen rows of scales; seven upper labials; black bluish or greenish above--- Z. constrictor.

2. Seventeen rows of scales; eight upper labials; brownish above----- Z. flagellum.

## Zamenis flagellum, Shaw.

Zamenis flagelliformis, Boulenger, Cat. Snakes, Brit Mus., I, 1893, p389.

Coluber flagellum, Shaw, Gen. Zool., II, Pt.II, p. 475, 1802.

### Key to sub-species.

I. Head and shoulders brownish; color becoming lighter toward the tail. Young crossbanded. These bands usually persisting in the adults. Z. f. flagellum.

II. Black, except the belly, which is pinkish or yellow (Cope) Z.f. piceus. Piceus does not occur in Kansas.

Zamenis flagellum flagellum, Shaw, Coach Whip.

Bascanium flagelliforme flagelliforme, Cope, Check-list N. Amer., Batr. Rept., 1875, p. 40.

Coluber flagelliformis, Holbrook, N. Amer. Herpet., I. 1836.p. 107.

Masticophis flagelliformes and Coluber testaceus, Baird and Girard, Cat. N. Amer. Rept., Pt. 1. Serpents, 1853. p. 98, 150.

Scales smooth in seventeen rows; first row wider than long. Frontal narrow behind, flaring near the front. Superciliaries broad, pointed in front. Prefrontals narrow behind, wide in front; the outer posterior angle just meeting the anterior angle of the superciliaries. Internasals small, anterior margin convex. Rostral recurved above and excavated below. Anterior nasal large, the upper angle extending nearly to the median dorsal line. Posterior nasal smaller. Nostril mostly in anterior nasal. Loreal small. Superior angle of the upper

anteorbital reaching the frontal. Lower anteorbital very small. Postorbitals two. Upper labials eight, fifth and seventh largest. Lower labials nine, fifth largest. Pre- and post-genials subequal. Gastrosteges 180-210. Urosteges 80-110. Anal divided. Sub-caudals in two series.

Color above yellowish to dark brown; darker anteriorly, ~~and~~ generally becoming lighter posteriorly. The young are crossbanded. These bands persist but become less conspicuous in the adult stage. Chin and throat white, usually a dark spot on each lower labial and genial. Belly yellow posteriorly, brown or spotted anteriorly. Top of head brown. Oculars yellowish. Each superior labial with a dark spot above.

Eye large. Head distinct from body. Body and tail very long and slender. Reaches an extreme length of six feet. It strikes viciously when disturbed, but is unable to inflict a serious wound on account of the shortness of its teeth.

Occurs throughout the southern and western part of Kansas. It has never been reported from the northern and eastern part.

Zamenis constrictor, Linnaeus, Blue Racer.

Zamenis constrictor, Boulenger, Cat. Snakes. Brit. Mus.I, 1893, p. 387.
Coluber constrictor, Linnaeus, Syst. Nat. ~~in Long's Exped.~~ I. 1766 p. 385.
Coluber flaviventris, Say, in Long's Exped. Rocky Mts., II, 1823, p. 185
Bascanion flaviventris, B. and G. Cat. N. Amer. Rept., Pt. I.p. 96.

Scales smooth, in seventeen rows; Head distinct from body. Body long and slender. Frontal broad in front, much narrowed posteriorly; lateral margins concave. Supraoculars broad behind, slightly narrowed in front. Occipitals short, truncate, with an acute angle in front. Prefrontals large, slightly wider than long. Internasals almost eliptical, short and broad: Rostral triangular , high and wide. Loreal trapzoidal higher than long. Preoculars two, the lower very small. Postoculars two. Temporals 2-2. Supralabials seven, sometimes eight, Infralabials eight, occasionally nine. Gastrosteges 170-185. Urosteges 66-100. Anal divided. Urosteges in two series. The following are the scutella and measurements of eight specimens in Kansas University Museum.

| Length | Tail | Gastrosteges | Urosteges | Scales |
|---|---|---|---|---|
| 16 1/2 | 3 3/4 | 172 | 82 | 17 |
| 49 | 9 1/2 | 181 | 73 | 17 |
| 14 3/4 | 3 3/4 | 187 | 82 | 17 |
| 34 1/2 | 6 1/2 | 181 | 66 | 17 |
| 36 1/2 | 8 3/4 | 177 | 82 | 17 |
| 13 1/2 | 8 5/16 | 177 | 83 | 17 |
| 43 1/2 | 11 | 177 | 86 | 17 |
| 41 1/3 | 9 3/4 | 174 | 81 | 17 |

Two specimens in the museum have two loreals on one side.

Color above uniform, ranging from greenish blue to black. The black variety is rare in Kansas. Greenish to yellowish below. Top of head brownish- blue becoming darker brown toward the snout; light brown on the side of the head in front of the eye. Lower half of the upper labials whitish, upper half bluish. Under part of head, whitish.

This species is the most abundant in the State. It is more numerous in the central, middle and western parts, than in the eastern. Its abundance is probably due to its ability to escape danger by its rapid movements and to its color blending well with both soil and shrubbery.

The racer has been known to follow persons for a short distance but it will flee if one advances toward it. There is a popular belief that it twines itself about person's legs when attacking them,

but the truth is that it never attacks unless one handles it. When captured the larger snakes strike vigorously once or twice and then try to escape without further fighting. The young are very pugnacious. Constrictor like many other harmless snakes has the habit of vibrating its tail rapidly when excited. The tail's vibrating among dry leaves makes a whirring noise much like the rattling of a rattlesnake. It feeds upon small mammals, toads, birds, eggs ~~etc.,~~ insects, and other snakes. Verril writes of a constrictor's vomiting up a copperhead and a toad. One that I had in this labaratory swallowed a small gartersnake. Insects are probably its principle food. I have found as many as eight crickets in the stomach of a small racer. Their habit of eating insects explains their presence in large num bers in grain fields where insects are very abundant.

The young of this species are spotted. The ground color above is dark olive with a dorsal series of dark rhomboidal spots. Two rows of small dark spots on each side. Two to four reddish spots on each gastrostege. The outer spots cover the end of the gastrosteges but a gastrostege usually has only one end thus covered, the opposite ends of adjoining plates being immaculate. The spots next the end spots are plano-convex, and smaller. The head is marked like that of the adult.

I have examined specimens from Mitchell, Ellis, Republic, Cloud Brown, Lyon, Franklin, Shawnee, Douglas, and Jefferson Counties. It has been reported from Stanton, Montgomery, Miami, Logan, Harvey, Neosho, Greenwood, Osborne, Sherman, Phillips and Pottawatomie Counties.

## Crotalidae.

The Crotalidae or Pit Vipers are represented in Kansas by four possibly five, species. These are the only poisonous snakes, They may be distinguished from harmless snakes by the presence of a pit between the eye and the nostril and by the presence near the front of the upper jaw a pair of large, perforate, erectile fangs.

### Key to Genera.

I No rattle----- Ancistrodon

II. A rattle----

1. Top of head with plates---- Sistrurus

2. Top of head with scales----- Crotalus

Ancistrodon, Beauvois.

Ancistrodon, Baird, Serpents N. Y. 1854, p. 13.

Agkistrodon, Beauvois, Trans. Amer. Phil. Soc./ IV, 1799, p. 381.

Toxicophis, Troost, Ann. Lyc. Nat. Hist. N. Y. III, 1833, p. 190.

Nine cephalic plates. A pit between the eye and the nostril. A pair of erectile poison fangs. Scales keeled, in 21-27 rows. No rattle. Anal entire.

### Key to Species. (Stejneger)

1. A loreal; orbit separated from supralabials by scales; usually 23 scale rows. A contortrix.

2. No loreal; supralabials entering orbit; 25 scale rows----A. piscivorus

No specimen of A. piscivorus has ever been reported from Kansas but every water snake found in our streams is called Water Moccasin. These harmless snakes have gotten a bad reputation from being aquatic. The poisonous Moccasin is easily distinguished from the harmless water snakes by the presence of the pit, by the erectile fangs and by the thickness of the body.

I think it very probable that A. piscivorus occurs in south eastern Kansas as it is found in Southern Missouri and in Arkansas and probably enters Kansas by way of the streams flowing from Kansas into these states. The description here given is taken from Stejneger.

**Ancistrodon piscivorus, Lacepede.**

Water Moccasin.

Crotalus piscivorus, Lacepede, Hist. Serp., II, 1787, p. 424.
Ancistrodon piscivorus, Cope, Proc. Acad. Nat. Sci., Phila. 1859, p 336.
Scytalus piscivorus, Latreille, Hist. Nat. Reptiles, III, 1801, p. 163.
Coluber aquaticus, Shaw, Gen. Zool. III, 1802, p. 425.
Toxicophis piscivorus, Baird and Girard, Cat. N. Amer. Rept., Pt. 1. Serp., 1853, p. 19.

Description after Stejneger.

No loral. Inferior wall of orbit constituted by third labial; 25 dorsal rows. Dark chestnut brown, with indistinct vertical dark bars. Line from superciliary along the edge of the head, through the middle of the secong supralabial row. A second line from the lowest point of the orbit parallel to the first.

Scales all large and well developed; those on the sides and back of head conspicuously so. Two nasal plates, with the nostril between them. Anterior orbitals 2, one above the other, the upper extening from the eye to the posterior nasal, the lower linear and forming the upper wall of the pit. Lower and posterior wall of pit constituted by a narrow plate resting along the third labial and terminating in the second. Third labial very large, constituting the inferior wall of the orbit, of which 3 scales from the posterior. Upper labials 8, very large and broad; lower 10. Occipitals terminated each by a triangular plate. All the scales on the back of the head carinated. Gastrosteges 130-145. Urosteges 39-45.

General color, dark chestnut brown with darker markings. Head above, purplish black. An absolete chestnut brown streak passes from the posterior end of the superciliary along the upper edge of the head, through the middle of the second row of supralabial scales. A narrow yellowish white line passes from the third labial or begins just below the lowest part of the orbit, and passing backward parallel with the first stripe crosses the angle of the mouth at the seventh labial and meets the first stripe on the side of the neck, where it is confluent with yellowish white of throat. On the lower labials are three short, nearly vertical, light bars; on fourth, sixth and seventh. The rest of the jaw itself, as well as the interval between the stripes on the sides of the head, dark purplish brown, of which color is also the space in

front and below the eyes. General color above dull dark chestnut brown. On each side a series of 20 or 30 narrow vertical, purplish black bars, 1 or 2 scales wide. Of these, sometimes 2 contiguous to each other on the same side are united into an arch, inclosing a space, the center of which is rather duskier than the ground color; at others corresponding bars from the opposite sides unite and form half rings, encircling the body. Sometimes there is a lighter shade bordering the dark bars. Beneath black, blotched with yellowish white.

The Water Moccasin as the name implies is a water snake. Holbrook states that it is found about damp swampy places or in water- far from which it is never observed. They attack everything that comes within their reach, erecting the head and opening the mouth for some seconds before striking. Their food is principally fish. They are ovoviviparous. Their poison is proportionally less virulent than that of the Rattlesnake and Copperhead, but on account of their large size they are dangerous. They sometimes reach a length of four feet.

Probably occurs in the southeastern part of Kansas.

Ancistrodon contortrix, Linnaeus.

Copperhead.

Agkistrodon contortrix, Baird and Gerard, Cat., N. Amer., Rept. Pt. 1, Serp., 1853, p. 17.

Ancistrodon contortrix, Baird and Gerard Serp. N.V. , 1854, p. 13.

Trigonocephalus contortrix, Holbrook, N. Amer. Herpet., III, 1842, p.39, pl. VIII.

Boa contortrix, Linnaeus, Syst. Nat. 1, 1866, p. 373.

Head triangular. Cephalic scutella nine. Occipitals divided into several irregular scales posteriorly. Superior labials eight, third and fourth largest. Inferior labials nine or ten. No superior labials enter the orbit. Dorsal rows of scales twenty-three, from nineteen to twenty-one posteriorly. Outer row of scales smooth, as wide as long, second row faintly keeled; all other dorsal scales strongly keeled. Two nasal plates nostril in anterior plate. A deep pit between eye and nostril. Anal plate undivided. Urosteges in some specimens entire, in others the posterior divided, anterior entire. Anteorbitals three. Post orbitals four to five. Tail short. Urosteges 30-50. Gastrosteges 145-155.

Color above light chestnut brown, mottled with very fine dark points. A series of dark brown markings above covering as much space as the ground color, from twelve to eighteen from head to annus, three on tail. Color beneath yellowish with series of black blotches alternating with and opposite the brown markings of the dorsal surface. Head brown. Each parietal with a small brown spot. Labials light. A black thread-like band extends from the orbit around the angle of the mouth and reaches the third infralabial. Length two to three feet.

The following are the scutella formula and dimensions of five specimens in the University Museum.

| Length | Tail | Gastrosteges | Urosteges | Scales |
|---|---|---|---|---|
| 11 3/4 | 1 5/8 | 150 | 46 | 23 |
| 22 3/4 | 2 3/4 | 149 | 44 | 23 |
| 22 1/4 | 2 3/4 | 146 | 44 | 25 |
| 22 1/2 | 3 1/4 | 152 | 46 | 23 |
| 20 | 2 7/8 | 152 | 46 | 23 |

This snake is rare in the eastern part of the state and is not found in the western part. It lives in low ground preferring timbered regions. It is more vicious than the rattle-snake. It strikes without warning

and seems to be always on the lookout for something upon which to use its fangs. It is less dangerous than the rattlesnake, according to Dr. Mitchell, because its poison is less virulent. Dr. Yarrow (13,422-35) states that of many cases recorded in medical journals he had found only one fatal case, the victim being a boy of six, however, some of the cases were very severe.

I have examined specimens from Douglas, Wabaunsee, and Franklin Counties. It has been reported from Neosho, Jefferson, Miami, Montgomery and Marshall Counties.

## Crotalus Linnaeus.

Crotalus, Linnaeus, Systema Naturae, 10th ed. 1758, p. 214; 12th ed., 1766, p. 572.

Caudisona, Laurenti, Spec. Syn. Rept., 1868, p. 92.

A jointed rattle at the end of the tail. The top of the head covered with scales. Head broad and neck contracted; subcaudals not divided.

Only two species of this genus are found in Kansas. These snakes are much larger than the Sistrurus and are consequently more dangerous.

I. Tail black; dorsal pattern consisting of dark, double-chevron shaped bands. A dark colored snake------- C. horridus.

II. Tail with brown or indistinct bands. Three rows of dark dorsal spots. A light postocular band reaches the second row of scales above the angle of the mouth. A light colored snake.----- C. confluentis.

Crotalus horridus, Linnaeus.

Banded or Timber Rattlesnake.

Crotalus horridus, Linnaeus, Syst. Nat. Ed. XII, I, 1766, p. 372.- Cope Proc. Acad. Nat. Sci. Phila. 1859, p. 338.

Crotalus durissus, Lartreille, Hist. Rept. III, 1801, p. 190.

Rows of scales 23-25, all strongly keeled excepting the first two rows which are faintly keeled. Top of head covered with small scales. Internasals triangular. The more acute angle directed outward. Superciliaries large and irregular in shape. Prefrontals small, touching the internasals in front and the superciliaries behind; between the prefrontals are several ( 3-7) small plates. The anterior nasals are small, rectangular, in contact with the rostral in front. The posterior nasal contains the nostril. It is smaller than the anterior and is subcircular. Rostral narrow and high. Supralabials 12-14, first and fourth or fifth largest. Infralabials 13-17, first largest. Two preoculars, lower generally crowded out of the orbit. It usually reaches the pit. The upper preocular is larger than the lower. Anterior to this are two or three small loreals. The upper labials are se parated from the eye by three rows of scales. Postgenials not present. Gastrosteges 165-180. Urosteges 20-30. Anal entire. Subcaudals undivided.

Ground color above yellowish to dark brown, maculated by five rows of dark spots, generally confluent posteriorily. The dorsal spots are large - about ten scales wide and five scales long. Alternating with these is a row of very small spots generally covering a small portion of four scales. Opposite the dorsal spots is a row of large diamond shaped spots. These slightly encroach upon the gastrosteges below. Alternating with these is row of small light colored spots on the margin of the gastrosteges. There are about twenty-one spots in each row. The tail is black above, lighter below. The belly is whitish in the middle with many small dark spots near the ends of the gastrosteges. Labials mostly white; 4-7 lower labials marked with black. A dark band extends from the orbit around the angle of the mouth.

This species is not numerous in the eastern part of the state, and I have no evidence of its occurence in the western part. The banded rattlesnake is exceeded in size only by the Diamond Rattlesnake. The largest specimens in the Kansas University Museum is fifty inches in length. Cope reports a specimen five feet in length. The body is very thick. One in the University Museum is

The following are the dimensions and scutellation of six specimens in the museum of the Kansas University.

| Length | Tail | Gastrosteges | Urosteges | Scales. |
|---|---|---|---|---|
| 40 | 2 1/2 | 172 | 24 | 23 |
| 26 | 1 1/2 | 174 | 23 | 23 |
| 50 | 3 1/2 | 170 | 28 | 23 |
| 40 | 2 1/4 | 172 | 23 | 23 |
| 47 | 3 | 176 | 24 | 25 |
| 42 | 2 3/4 | 173 | 21 | 25. |

C. horridus is called the Timber Rattlesnake because of its preference for wooded districts. It sometimes climbs trees but usually stays among rocks and fallen timber. It is sometimes found far from timber in the open fields and praries. It is sluggish in its movements and does not strike unless irritated. It feeds upon rats, mice, birds, young rabits and other small animals.

I have examined specimens from Douglas, Brown, Franklin, and Wabaunsee Counties.

Crotalus confluentis, Say.

Confluent or Prairie Rattlesnake, sometimes called Massauga.

Crotalus confluentis, Say, Long's Exped. Rocky Mts., II, 1823, p. 48.
Crotalus confluentis confluentis and pulverulentus, Cope, Crocodilians Lizards and Snakes, 1898, p. 1170.
Crotulus confluentis, Stejneger, Rept., U. S. Nat. Mus. for 1893, 1895 p. 440/

Scales in 23-27 rows. First and second rows faintly or not keeled, a few dorsal rows strongly keeled. Superciliares large, projecting above the eye. Prefrontals small overlaping the superciliaries. Internasals smaller than in horridus. Between the internasals two hornlike scales and several smaller scales; all the remainder of the top of the head covered with scales. Rostral higher and slightly wider than in horridus. The anterior nasal is almost square. Posterior nasal earshaped. (Nare ) in the anterior part of it. One or two small loreals. Four rows of scales between the eye and the labials. Supralabials 13-15. Infralabials 14-18. Pregenials broad and short. Gastrosteges 170-190. Urosteges 20-30 Anal entire.

Grayish to brownish above, with a dorsal series of large rhomboid-oval spots. The spots have dark brown borders and are lighter in the middle. The dark scales forming the spots often have very narrow light borders. Alternating with the dorsal spots are smaller much lighter colored spherical and oval spots. These become opposite and coalesce with the dorsal spots on the tail forming cross-bars. The belly is yellowish with gray at the ends of the gastrosteges. The under part of the head is whitish; the labials are marked with very dark gray to brown. The top of the head is brown. A light stripe extends from the upper posterior angle of the orbit backward around the angle of the mouth. A light stripe extends from the upper part of the posterior nasal plate to a little behind the middle of the maxillary. The lower edges of the upper labials are white. The temporal scales are margined with white.

This species is quite numerous in the western part of the State but is not found in the eastern part. It is found in considerable numbers in prairie-dog towns. Its feeds upon prairie-dogs, gophers and other small animals.

It does not live in peace with the prairie-dogs as so many people believe, but is their deadly enemy. The young dogs are its special prey. It protects itself by retreating into the holes of the prairie

dogs. It seldom reaches a length of more than three and one half feet, and on account of its size is not as dangerous as C. horridus. It does not hibernate until late in the year, often being met with as late as the middle of November.

Sistrurus, Garman.

Sistrurus, Garman, N. Amer. Reptiles, 1883, p. 110.

Crotalus, Linnaeus, part, Syst. Nat., 12th ed., 1766, p. 372.

Caudisona, Fitzinger, New Class. Rept., 1826, p. 63.

Nine symmetrical head-plates. Tail with rattle at extremity. A pair of large erectile fangs in front of maxillae. Loreal pit present. Scales keeled, from 21-25 rows.

Key to the species in the United States.(Brown)

Post-nasal in contact with preocular; the light line to angle of mouth begins at nostril------ S. catenatus.

Post-nasal separated from preocular by loreal; light line to angle of mouth begins at the eye---- S. miliarius.

Sistrurus catenatus, Garman, Prairie Rattlesnake or Massanga,

Sistrurus catenatus, Garman, N. Amer. Reptiles, 1883, p. 118.

Crotalus tergeminus, Say., Long's Exped. Rocky Mts. I. p. 499.

Caudisona tergeminus, Wagler, Nat. Syst. Amph. p. 176.

Rows of scales 23-25; outer row not keeled, second row keeled only at the base or not at all. Outer margin of the occipitals rounded. Occipitals broad posteriorly, narrow anteriorly. Considerable variation appears in these plates. In some specimens they are narrower posteriorly than anteriorly and lose their rounded outline.Frontal triangular with gently convex margins,in the type specimen. This plate also presents many variations. In a specimen now before me it is regularly pentagonal. Frequently it is truncated at the apex and the separated part remains as an extra plate. Superciliaries large, broad in the middle and narrow at the ends. Prefrontals with only one sharp angle; the outer margin rounded. Internasals triangular, anterior margin convex, posterior margin concave. Rostral high and narrow, broadest near the lower edge. Two nasals, anterior rectangular, narrow and high; posterior almost triangular. Nostril very small. Preoculars long and irregular, the upper reaching nearly to the internasal. Loreal small and irregular in shape. Superior labials 10-12. Inferior labials 12-15. Gastrosteges 135-155. Urosteges 20-32. Anal entire. Subcaudals undivided.

Color above gray or brownish, occasionally black. There are three series of dorsal blotches. These blotches are grayish brown to blackish internally and have a narrow black margin. The black is bordered externally by a narrow yellowish margin. The superior spots are large and oboval in shape. The lateral spots are smaller, and rounded,

but are of the same color as the dorsal series. The belly ranges in color from yellowish to black. The most frequent color marking is a yellowish ground color maculated with many large black blotches. A dark brown stripe with narrow black margins extends backward from the eye onto the neck. A narrow yellowish streak extends from the nostril backward to the angle of the mouth. The anterior part of the lower jaw is black. The fifth, sixth and seventh lowerlabials are partly yellow. A narrow yellow stripe runs downward from the pit. The accompanying drawing shows the color marking of the top of the head.

By most hereptologists this species is divided into two subspecies. The characters upon which this division is based are not constant. Kansas is the northern limit of the southern variety and the southern limit of the northern variety but in Kansas specimens there are no markings constant enough to warrant the ~~sub~~ divisions into sub-species. It varies enough to include both varieties but the series of variations is complete. A specimen now before me agrees with catenatus in head plates and the shape of the head but has but fifty-three spots. Other specimens having the head plates of Edwardsii have less than forty spots and the scales are in twenty-five

This snake is not large as [illegible] exceeding thirty inches in length. Its poison is no less virulent than that of the larger snake. I have known personally of several persons being bitten and the results were always serious. In one case, the victim, a child of five years, died.

The Massasauga or Prairie Rattler is a truly prairie snake, but it is found in largest numbers on low sandy soil near rivers and small streams. It occurs throughout the State but is rarely found in the eastern part. I have examined specimens from Republic, Cloud, Mitchell, Clay, Wabaunsee, Leavenworth, Brown, Franklin, Shawnee and Lyon Counties. It has been reported from Hamilton, Morton, Stanton, Montgomery, Logan, Harvey, Neosho, Greenwood, Osborne, Sherman, Phillips and Pottawatomie Counties.